

REMARKS

This amendment is responsive to the Office Action of September 12, 2007. Reconsideration and allowance of the claims 1-20 are requested.

The Office Action

Claims 1-7 stand rejected under 35 U.S.C. § 102 as being anticipated by Zhu (US 2004/0051529; US 7,009,396).

The Zhu Reference

Zhu focuses primarily on a non-parallel imaging technique in which the even phase encoding steps are generated on a pass through the subject in one direction and the odd numbered phase encoding views are taken on the return pass [0028]. There is no disclosure that suggests that this non-parallel imaging technique should acquire or use a sensitivity map as part of the reconstruction.

Paragraphs [0041] – [0043] suggest that a parallel imaging technique, such as SENSE, could be utilized. Paragraph [0043] does recognize that a reduction of K-space sampling density leads to aliasing along the phase encode directions. Paragraph [0041] indicates that frequency encoding should be along the table translation direction, i.e. phase encoding should be perpendicular to it.

Paragraph [0043] lists the various problems encountered when using SENSE or other parallel reconstruction techniques. Paragraph [0043] provides a first suggestion for curing these problems in which the receive coil extends over the full range of travel which would create a single or full field of view data sampling. This first technique uses bandwidth filtration. It is submitted that this first technique addressed by Zhu is analogous to the acknowledged prior art described at page 5, lines 25-34 of the present application and suffers the drawbacks discussed in the present application.

Zhu's second solution is an algebraic solution.

First, it is submitted that Zhu fails to describe the parallel imaging embodiment in sufficient detail as to enable others to make and use it. Zhu recognizes the problems, and suggests a direction to explore solving them. Zhu does not further proceed to disclose a solution.

The Claims Distinguish Patentably Over the References of Record

Claim 1 calls for acquiring at least two adjacent fields of view. Zhu's first technique in paragraph [0043] extends to receive coils over the full range of travel which essentially creates a single field of view. Zhu's second suggestion in paragraph [0043] relates to an algebraic correction, which algebraic correction is not disclosed. Accordingly, it is submitted that claim 1 is not anticipated by Zhu.

New claim 8 calls for the sample data to be folded into adjacent fields of view. Zhu does not disclose that the SENSE or other parallel imaging data is folded from one field of view into another. In Zhu's parallel imaging embodiment, the frequency encoding is along the direction of movement.

Dependent claims 9 and 10 relate to unfolding the folded data, subject matter to which Zhu does not address.

Dependent claim 11 calls for applying a phased increment to a receiver demodulation frequency. Such a step is not suggested by Zhu.

Claim 12 relates to correcting geometric distortion. Zhu fails to address both unfolding folded data and correcting for geometric distortion.

Dependent claim 13 further adds a masking step. A masking step not suggested by Zhu.

Claim 14 sets forth a step and shoot type process in which data of one field of view is folded into data from an adjacent field of view.

Claim 15 calls for the phase of code direction to be parallel to the direction of motion. Zhu teaches against this orientation by pointing out the aliasing that occurs if the phase encoding is in this orientation and calling for the frequency encoding to be along the direction of motion.

Accordingly, it is submitted that claim 1 and claims 2-5, 8-14, and 19 are not anticipated by and distinguish patentably over Zhu and the other references of record.

Claim 6 calls for reconstructing an image from sampled signals from at least two adjacent fields of view which are weighted with a sensitivity factor. Zhu does not provide an enabling disclosure for reconstruction from two adjacent subsampled fields of view weighted with a sensitivity factor.

Dependent claims 16-19 add additional details to claim 6 and distinguish more forcefully over Zhu and the references of record.

Accordingly, it is submitted that claim 6 and claims 16-19 dependent therefrom are not anticipated by and distinguish patentably over Zhu and the other references of record.

Claim 7 is directed to a computer readable medium which carries a program which reconstructs data from a pair of under sampled adjacent fields of view which fields are folded into each other by weighting with a sensitivity factor and unfolding the folded data. Zhu fails to teach or fairly suggest such a program. Accordingly, it is submitted that claim 7 and claim 20 dependent therefrom distinguishes patentably and unobviously over Zhu and the other references of record.

Corrections to the Drawings

The specification has been amended to refer clearly to Figures 1a, 1b, etc. Further, additional Figures 6-11 have been added. Figures 6-11 are fully described by and diagrammatically illustrate the steps set forth in the description set forth on pages 5-8 of the present application. Because the additional figures are diagrammatic only and are fully described by the text, it is submitted that the new Figures 6-11 contain no new matter and are properly entered.

Twelve (12) sheets of substitute drawings including Figures 1a-11 are enclosed.

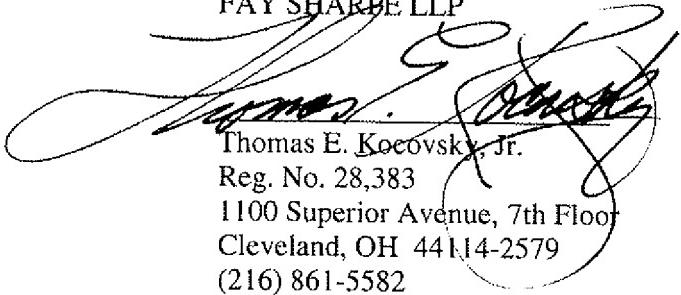
CONCLUSION

For the reasons set forth above, it is submitted that all claims distinguish patentably over the references of record and meet all statutory requirements. An early allowance of claims 1-20 is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case, she is requested to telephone Thomas Kocovsky at (216) 861-5582.

Respectfully submitted,

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